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WEIGHTS AND COOKED YIELDS OF BROILER PARTS RELATED TO EVISCERATED CARCASS WEIGHTS

ARS-S-46
October 1974

AGRICULTURAL RESEARCH SERVICE • U.S. DEPARTMENT OF AGRICULTURE

CONTENTS

	Page
Introduction	1
Cut descriptions	1
Tables	5

Illustrations

Fig.		
1.	Breast cuts (part 1)	2
2.	Breast cuts (part 2)	2
3.	Thigh cuts	3
4.	Drumstick cuts	3
5.	Wing cuts	4
6.	Quarter cuts	4

Tables

1.	Relation of weights of cuts to weights of eviscerated broiler carcasses	5
2.	Split breast weights by carcass size	6
3.	Wing weights by carcass size	6
4.	Thigh weights by carcass size	7
5.	Drumstick weights by carcass size	7
6.	Three-piece-leg weights by carcass size	7
7.	Quartered-carcass weights by carcass size	7
8.	Skin, bone, and meat yields from cooked broiler parts	8
9.	Cooked yield and deboning loss from broiler parts	8

WEIGHTS AND COOKED YIELDS OF BROILER PARTS RELATED TO EVISCERATED CARCASS WEIGHTS

By Joe Phil Hudspeth, C. E. Lyon, B. G. Lyon, and A. J. Mercuri[1]

INTRODUCTION

Poultry processors, food service managers, and others concerned with controlled-portion products may choose from numerous broiler cuts in meeting their various needs. This booklet is intended to reduce the chance involved in such decisions, minimize variations in portion size, aid in costing products, and suggest the interchangeability of cuts by showing the relationship between each of 25 cuts and the carcass, both raw and cooked.

The information was derived from a study of 960 broilers weighing from less than 1 pound to 3.5 pounds (2-pound average weight).[2] These were cut up by one of eight commercial techniques. In all, 1,920 broiler pieces were cooked. In using the cooked-yield data (tables 8 and 9), it should be kept in mind that the pieces were cut, frozen, thawed, drained, cooked, and cooled. Since freezing tends to increase cooked yields, the values may be somewhat higher than one would expect under commercial conditions.

CUT DESCRIPTIONS

Breast Cuts

Split Breast.—The piece was obtained by cutting on each side of the vertebral column beginning at the midpoint of the sternal ribs until the breast was completely severed from the back. The last cut split the whole breast through the midpoint of the sternum (fig. 1*A*). Other name: GI breast. Note: A portion of the back is removed in this cutting operation.

Keel-Cut Breast.—This cut was made at the distal end, or tip, of the sternal crest and continued dorsally across the fifth and sixth vertebral ribs until the pectoralis muscles were separated from the whole breast. The remaining breast portion was then split as described under "Split Breast With Back" (fig. 1*B*).

Wishbone-Cut Breast.—The clavicle, or wishbone, was removed from the carcass by a cut beginning at the anterior end of the sternum and extending dorsally along the coracoid. This piece was separated from the breast at the junction of the clavicle and coracoid (fig. 1*C*). The remainder of the breast was split as described under "Split Breast With Back."

Quartered Breast.—Breasts were quartered by two cuts: (1) A longitudinal cut to yield two halves, as described under "Split Breast With Back," and (2) a cut through each half, beginning at the point of the sternal crest and extending transversely between the second and third sternal ribs and across the fifth and sixth vertebral ribs, severing the spinal column at approximately the seventh lumbar vertebra (fig. 1*D*). Other name: quartered-breast portions with back.

Split Breast With Shoulder.—By placing a knife in the body cavity at the anterior end of the vertebral column, a cut was made in the ventral posterior direction to split the breast through the center of the sternum. The skin was then cut along the entire length of the vertebral column and around the last thoracic rib in such a fashion as to loosen the skin from the carcass. Pressure was applied on the breast portion, and

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[2] The experimental details and data analysis have been published elsewhere. See J. P. Hudspeth, C. E. Lyon, B. G. Lyon, and A. J. Mercuri, 1973, "Weights of Broiler Parts As Related to Carcass Weight and Type of Cut," J. Food Sci. 38: 145-150, and C. E. Lyon, B. G. Lyon, and J. P. Hudspeth, 1973, "The Effect of Different Cutting Procedures on the Cooked Yield and Tenderness of Cut-Up Broiler Parts," Poult. Sci. 52: 1103-1111.

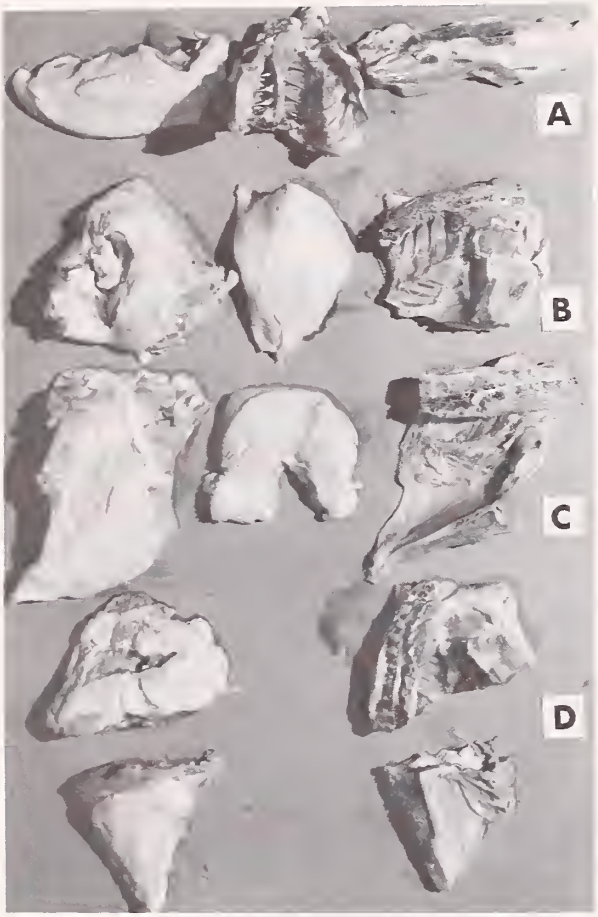

FIGURE 1.—Breast cuts (part 1).
A, Split breasts (*center*, back portion removed in cutting). *B*, Keel-cut breasts (*center*, keel portion). *C*, Wishbone-cut breasts (*center*, wishbone portion). *D*, Quartered breasts (*top*, anterior; *bottom*, posterior).

the split breasts with scapula were pulled away from the remaining ribs (fig. 2*A*). Note: A portion of the back is removed in this cutting operation.

Split Breast With Back.—Wings were removed as described under "Wing Cuts." The breast was then split by a longitudinal cut beginning at the first thoracic vertebra and extending posteriorly through the sixth thoracic vertebra, splitting both vertebral column and sternum (fig. 2*B*).

Split Breast With Ribs.—A cut was made on each side of the back beginning at the position posterior to the seventh rib and extending anteriorly to a point where the breast with ribs (sternal and vertebral ribs) and scapula were completely separated from the back. The breast was then split down the center of the sternum (fig. 2*C*). Note: A portion of the back is removed in this cutting operation.

Thigh Cuts

Thigh.—The thigh was cut as described under "Thigh With Connecting Fat and Skin," except the loin, or oyster, muscle was left on the remaining back. The thigh and drumstick were separated at the joint (fig. 3*A*). Other name: square-cut thigh. Note: A portion of the back is removed in this cutting operation.

Thigh With Connecting Fat and Skin.—This piece was obtained by a cut through the junction of the thigh muscles with the pelvic girdle to the hip joints, disjointing the femur. The leg was then separated from the back by pulling the loin, or oyster, muscle off with the thigh. The thigh and drumstick were separated at the joint (fig. 3*B*). Other name: strip-cut thigh. Note: A por-

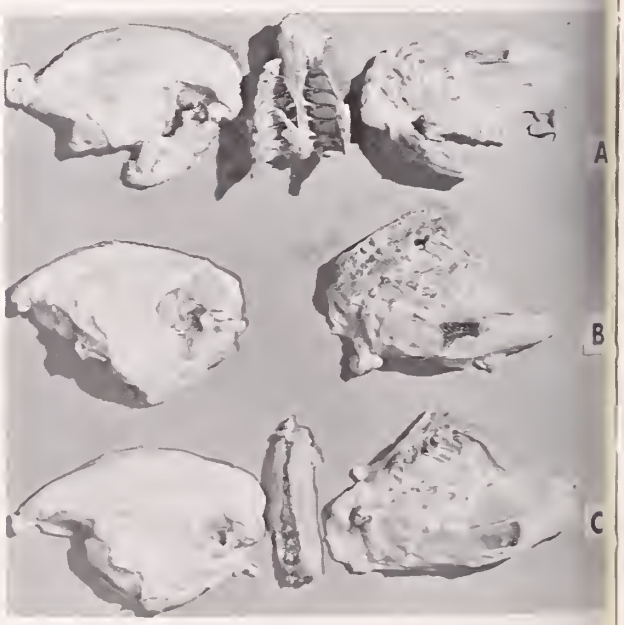

FIGURE 2.—Breast cuts (part 2).
A, Split breasts with shoulder (*center*, back portion removed in cutting). *B*, Split breasts with back. *C*, Split breasts with ribs (*center*, back portion removed in cutting).

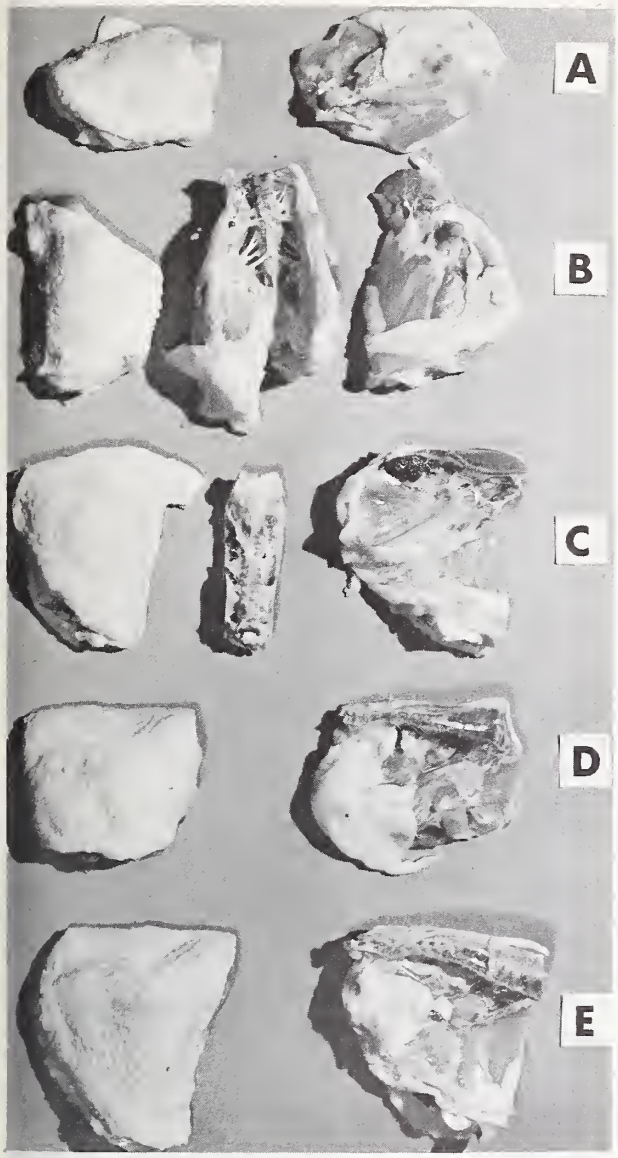

FIGURE 3.—Thigh cuts. *A*, Thighs. *B*, Thighs with connecting fat and skin (*center*, back portion removed in cutting). *C*, Thighs with back portion (*center*, back portion removed in cutting). *D*, Thigh portions with back. *E*, Thigh with back.

tion of the back is removed in this cutting operation.

Thigh With Back Portion.—The drumstick was first removed at the joint. A longitudinal cut of the thigh-back portion was then made beginning at the seventh thoracic vertebra and extending posteriorly on either side of the lumbar and sacral vertebrae, completely removing this portion of the backbone, consisting of a 1/2- to 1-inch-wide strip (fig. 3*C*).

Thigh Portion With Back.—The back and portion of two thighs were cut longitudinally, beginning at the seventh thoracic vertebra and extending posteriorly, splitting the lumbar-sacral vertebrae in half (fig. 3*D*).

Thigh With Back.—The initial cut was made as described under "Drumstick," with the second cut made as described under "Three-Piece Leg" (fig. 3*E*).

Drumstick Cuts

Drumstick.—The drumstick was separated from the thigh by a cut through the joint formed by the femur, fibula, and tibia (fig. 4*A*).

Drumstick With Thigh Portion.—The drumstick with thigh portion was made by cutting the femur 1 inch above the joint formed by the femur, fibula, and tibia. The resulting portion contained the fibula and tibia and approximately 1 inch of the femur (fig. 4*B*).

Three-Piece Leg.—The entire leg with back was cut into three pieces with a band saw as follows: Each leg was cut 1 inch above and 1 inch

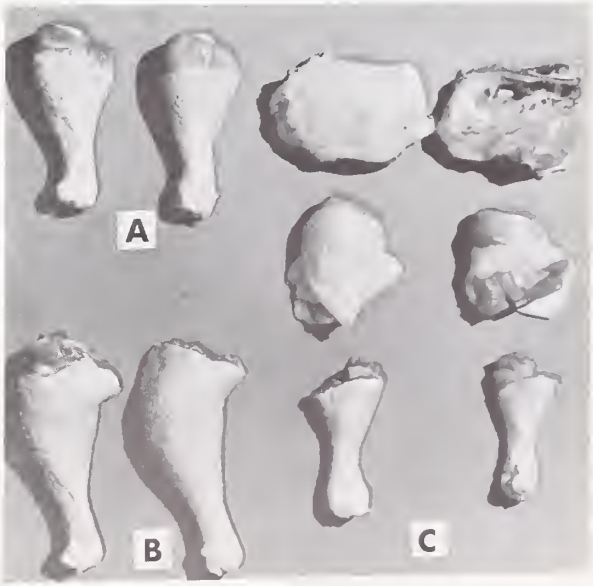

FIGURE 4.—Drumstick cuts. *A*, Drumsticks. *B*, Drumsticks with thigh portions. *C*, Three-piece legs (*top*, thigh portions with back; *center*, drumsticks with thigh portions; *bottom*, drumstick portions).

below the joint formed by the femur, fibula, and tibia. The remaining portion, consisting of the back and upper portion of the two thighs, was then cut longitudinally, beginning at the seventh thoracic vertebra and extending posteriorly, splitting the lumbar-sacral vertebrae in half (fig. 4*C*). Names for pieces: drumstick portion, thigh-drumstick portion, and thigh portion with back.

Wing Cuts

Wing Segments.—The wing tip was removed at the distal end of forearm, the forearm was removed by cutting through the joint at the distal end of the humerus, and the proximal wing portion was removed as described below for cutting through the shoulder joint (fig. 5*A*).

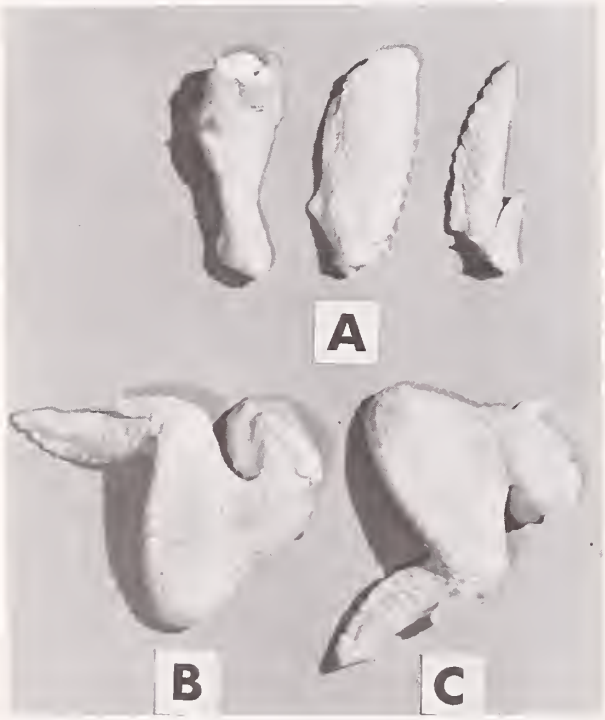

FIGURE 5.—Wing cuts. *A*, Wing segments (*left*, proximal; *center*, distal; *right*, tip). *B*, Wing with breast portion. *C*, Wing.

Wing With Breast Portion.—These were cut by removing approximately 1 inch of pectoralis major with the shoulder joint. The portion of the pectoralis major removed was that which completely encompassed the shoulder joint (fig. 5*B*).

Wing.—The wings were removed by a cut through the shoulder joint at the proximal end of the humerus (fig. 5*C*).

Quarter Cuts

Forequarter.—A longitudinal cut was made beginning at the first thoracic vertebra and extending posteriorly through the sixth thoracic vertebra, cutting the keel in half (fig. 6*A*). Other name: front quarter.

Whole Leg With Back.—The piece was obtained by a cut beginning at the seventh thoracic vertebra and extending posteriorly, splitting the lumbar-sacral vertebrae in half (fig. 6*B*). Other names: hindquarter and rear quarter.

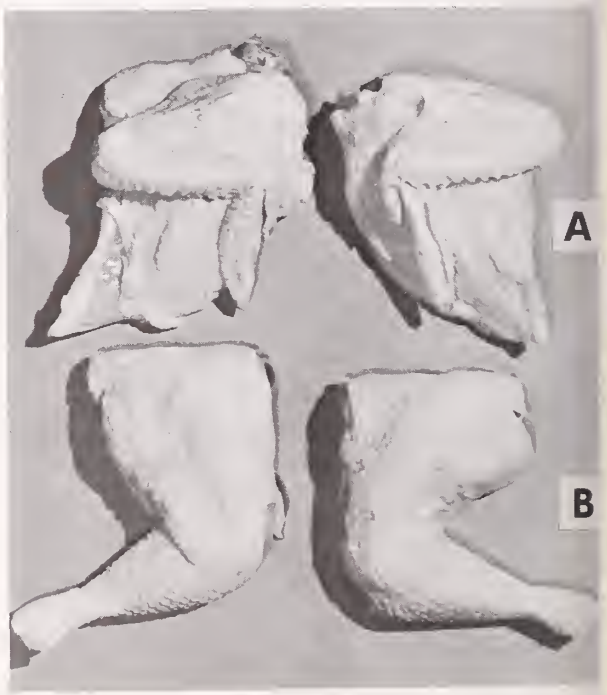

FIGURE 6.—Quarter cuts. *A*, Forequarters. *B*, Whole legs with back attached (hindquarters).

TABLES

TABLE 1.—*Relation of weights of cuts to weights of eviscerated broiler carcasses*

Cut	Percent of carcass weight[1]
Forequarter	25.1
Breast cuts:	
Split breast with back	17.2
Keel-cut breast	13.5
Keel portion	8.8
Wishbone-cut breast	14.8
Wishbone portion	7.1
Quartered breast:	
Anterior	10.6
Posterior	7.3
Split breast with shoulder	15.3
Split breast with ribs	15.3
Split breast (GI)	13.5
Wing cuts:	
Wing	7.4
Wing with breast portion	8.2
Wing segments:	
Proximal (1st joint)	3.4
Distal (2d joint)	2.8
Tips	1.9
Whole leg with back (hindquarter)	24.4
Thigh cuts:	
Thigh with back	16.6
Thigh with back portion	13.9
Thigh portion with back	11.6
Thigh with connecting fat and skin	10.9
Thigh	9.1
Thigh portion with back (from 3-piece leg)	8.9
Thigh-drumstick portion (from 3-piece leg)	9.5
Drumstick cuts:	
Drumstick	8.4
Drumstick with thigh portion	11.8
Drumstick portion (from 3-piece leg)	5.4
Back portions removed from —	
"Thigh with back portion"	2.8
"Split breast with shoulder" and "thigh with connecting fat and skin"	16.3
"Split breast with ribs"	5.3
"Split breast" and "thigh"	22.9

[1] Each percentage is the mean of 240 values.

TABLE 2.—*Split breast weights by carcass size*

[Ounces]

Carcass weight	Split breast with back	Keel-cut breast	Keel portion	Wishbone-cut breast	Wishbone portion	Quartered breast		Split breast with shoulder	Split breast with ribs	Split breast
						Anterior	Posterior			
14	2.5	1.9	1.2	2.1	1.2	1.5	1.1	2.3	2.2	2.0
16	2.9	2.2	1.4	2.4	1.3	1.7	1.3	2.6	2.6	2.2
18	3.2	2.4	1.6	2.7	1.5	1.9	1.4	2.8	2.9	2.5
20	3.5	2.7	1.8	3.0	1.6	2.1	1.6	3.1	3.2	2.7
22	3.8	3.0	1.9	3.3	1.7	2.3	1.7	3.4	3.5	3.0
24	4.2	3.2	2.1	3.6	1.8	2.6	1.8	3.7	3.8	3.3
26	4.5	3.5	2.3	3.9	1.9	2.8	1.9	4.0	4.0	3.6
28	4.8	3.8	2.5	4.2	2.0	3.0	2.1	4.3	4.3	3.8
30	5.2	4.0	2.7	4.5	2.1	3.2	2.2	4.6	4.6	4.1
32	5.5	4.3	2.8	4.8	2.3	3.4	2.3	4.9	4.9	4.4
34	5.8	4.6	3.0	5.1	2.4	3.6	2.4	5.3	5.2	4.6
36	6.2	4.9	3.2	5.4	2.5	3.9	2.6	5.5	5.5	4.9
38	6.5	5.1	3.4	5.7	2.6	4.1	2.7	5.8	5.8	5.1
40	6.8	5.4	3.6	6.0	2.7	4.3	2.9	6.1	6.1	5.4
42	7.2	5.7	3.7	6.2	2.9	4.5	3.0	6.4	6.4	5.6
44	7.5	5.9	3.9	6.5	3.0	4.7	3.1	6.7	6.7	5.9
46	7.8	6.2	4.1	6.8	3.3	4.9	3.3	6.9	7.0	6.2
48	8.2	6.5	4.3	7.1	3.2	5.2	3.4	7.3	7.3	6.4
50	8.5	6.8	4.5	7.4	3.3	5.4	3.6	7.5	7.6	6.7
52	8.8	7.0	4.6	7.7	3.4	5.6	3.7	7.8	7.9	7.0
54	9.2	7.3	4.8	8.0	3.6	5.8	3.8	8.1	8.2	7.3

TABLE 3.—*Wing weights by carcass size*

[Ounces]

Carcass weight	Wing	Wing with breast portion	Wing segments	
			Proximal	Distal
14	1.1	1.0	0.6	0.5
16	1.3	1.2	.6	.5
18	1.4	1.3	.7	.6
20	1.5	1.6	.8	.6
22	1.7	1.7	.8	.7
24	1.8	1.9	.9	.7
26	1.9	2.0	.9	.8
28	2.0	2.1	1.0	.8
30	2.2	2.2	1.0	.9
32	2.3	2.4	1.0	.9
34	2.4	2.5	1.1	1.0
36	2.6	2.7	1.2	1.0
38	2.7	2.8	1.2	1.0
40	2.8	3.0	1.3	1.1
42	3.0	3.1	1.3	1.1
44	3.1	3.3	1.4	1.2
46	3.2	3.4	1.5	1.3
48	3.4	3.6	1.6	1.3
50	3.5	3.8	1.7	1.4
52	3.7	4.0	1.7	1.4
54	3.8	4.0	1.8	1.5

TABLE 4.—*Thigh weights by carcass size*

[Ounces]

Carcass weight	Thigh with back	Thigh with back portion	Thigh portion with back	Thigh with connecting fat and skin	Thigh
14	2.3	1.8	1.5	1.6	1.2
16	2.6	2.1	1.8	1.8	1.4
18	3.0	2.4	2.0	2.0	1.6
20	3.2	2.7	2.2	2.2	1.8
22	3.6	3.0	2.5	2.5	2.0
24	4.0	3.3	2.7	2.7	2.2
26	4.3	3.6	3.0	2.9	2.4
28	4.6	3.9	3.2	3.1	2.6
30	5.0	4.2	3.5	3.3	2.8
32	5.3	4.5	3.7	3.5	2.9
34	5.7	4.8	4.0	3.7	3.1
36	6.0	5.1	4.2	3.9	3.3
38	6.3	5.4	4.5	4.2	3.5
40	6.7	5.7	4.7	4.4	3.7
42	7.0	6.0	5.0	4.6	3.8
44	7.3	6.3	5.2	4.8	4.0
46	7.7	6.6	5.5	5.0	4.2
48	8.0	6.9	5.7	5.2	4.4
50	8.4	7.2	6.0	5.4	4.6
52	8.7	7.5	6.2	5.6	4.8
54	9.0	7.8	6.5	5.9	5.0

TABLE 5.—*Drumstick weights by carcass size*

[Ounces]

Carcass weight	Drumstick	Drumstick with thigh portion	Drumstick portion[1]
14	1.1	1.6	0.7
16	1.3	1.9	.8
18	1.5	2.1	.9
20	1.6	2.4	1.0
22	1.8	2.6	1.2
24	2.0	2.8	1.3
26	2.1	3.0	1.4
28	2.3	3.3	1.5
30	2.5	3.5	1.7
32	2.7	3.7	1.8
34	2.8	4.0	1.9
36	3.0	4.2	2.0
38	3.2	4.5	2.1
40	3.3	4.7	2.2
42	3.5	4.9	2.3
44	3.7	5.2	2.5
46	3.8	5.4	2.6
48	4.0	5.7	2.7
50	4.2	5.9	2.8
52	4.3	6.1	2.9
54	4.5	6.4	3.0

[1] From 3-piece leg.

TABLE 6.—*Three-piece-leg weights by carcass size*

[Ounces]

Carcass weight	Drumstick portion	Thigh-drumstick portion	Thigh portion with back
14	0.7	0.9	1.4
16	.8	1.1	1.6
18	.9	1.4	1.7
20	1.0	1.6	1.9
22	1.2	1.8	2.0
24	1.3	2.0	2.2
26	1.4	2.3	2.4
28	1.5	2.5	2.5
30	1.7	2.8	2.7
32	1.8	3.0	2.9
34	1.9	3.2	3.0
36	2.0	3.5	3.2
38	2.1	3.7	3.3
40	2.2	4.0	3.4
42	2.3	4.1	3.7
44	2.5	4.4	3.9
46	2.6	4.7	4.0
48	2.7	4.9	4.1
50	2.8	5.1	4.2
52	2.9	5.3	4.5
54	3.0	5.6	4.8

TABLE 7.—*Quartered-carcass weights by carcass size*

[Ounces]

Carcass weight	Fore-quarter	Hind-quarter[1]
14	3.5	3.5
16	4.0	4.0
18	4.5	4.4
20	5.0	4.9
22	5.5	5.4
24	6.0	5.8
26	6.5	6.4
28	7.0	6.9
30	7.5	7.3
32	8.0	7.8
34	8.5	8.3
36	9.0	8.8
38	9.5	9.3
40	10.0	9.7
42	10.6	10.2
44	11.1	10.7
46	11.6	11.2
48	12.1	11.7
50	12.6	12.2
52	13.1	12.6
54	13.6	13.1

[1] Whole leg with back.

TABLE 8.—*Skin, bone, and meat yields from cooked broiler parts, percent by weight*[1]

Cut	Skin	Bone	Meat
FOREQUARTER			
Forequarter	17.2	33.0	46.4
Breast cuts:			
Split breast with back	11.1	27.2	59.6
Keel-cut breast	10.9	37.6	49.6
Keel portion	19.1	13.6	65.6
Wishbone-cut breast	11.2	35.7	50.6
Wishbone portion	16.2	3.4	77.5
Quartered breast:			
Anterior	12.1	28.8	55.9
Posterior	10.9	28.2	58.3
Split breast with shoulder	14.0	18.9	64.5
Split breast with ribs	10.9	20.2	66.0
Split breast (GI)	11.6	18.8	67.5
Wing cuts:			
Wing[2]	22.2	43.5	29.5
Wing with breast portion[2]	21.4	41.6	33.3
Wing segments:			
Proximal (1st joint)	19.0	42.1	34.8
Distal (2d joint)	30.1	32.5	31.9
WHOLE LEG WITH BACK (HINDQUARTER)			
Whole leg with back (hindquarter)	14.7	29.0	53.2
Thigh cuts:			
Thigh with back	17.9	28.8	51.5
Thigh with back portion	14.8	26.3	56.0
Thigh portion with back (from 3-piece leg)	14.1	27.8	55.7
Thigh with connecting fat and skin	19.1	21.5	57.4
Thigh	16.2	24.8	55.6
Thigh-drumstick portion (from 3-piece leg)	17.9	26.0	54.3
Drumstick cuts:			
Drumstick	9.4	34.0	53.5
Drumstick with thigh portion	13.6	33.6	50.1
Drumstick portion (from 3-piece leg)	11.7	32.1	53.8

[1] Each percentage is the mean of 80 values, except for the keel and wishbone portions of the breast, based on 40 values.

[2] Wing tips included in the bone percentage.

TABLE 9.—*Cooked yield and deboning loss from broiler parts, percent by weight*[1]

Cut	Cooked yield	Deboning loss
FOREQUARTER		
Forequarter	90.5	3.3
Breast cuts:		
Split breast with back	85.0	2.1
Keel-cut breast	82.6	1.6
Keel portion	81.4	1.7
Wishbone-cut breast	80.3	2.5
Wishbone portion	72.1	2.9
Quartered breast:		
Anterior	80.4	3.2
Posterior	83.6	2.6
Split breast with shoulder	83.0	2.7
Split breast with ribs	85.6	2.9
Split breast (GI)	79.2	2.1
Wing cuts:		
Wing	96.3	4.8
Wing with breast portion	93.9	3.7
Wing segments:[2]		
Proximal (1st joint)	86.6	4.2
Distal (2d joint)	92.6	5.5
WHOLE LEG WITH BACK (HINDQUARTER)		
Whole leg with back (hindquarter)	89.4	3.1
Thigh cuts:		
Thigh with back	85.7	1.8
Thigh with back portion	81.1	2.9
Thigh portion with back (from 3-piece leg)	83.1	2.4
Thigh with connecting fat and skin	79.7	2.0
Thigh	83.9	3.4
Thigh-drumstick portion (from 3-piece leg)	81.0	1.8
Drumstick cuts:		
Drumstick	87.1	3.0
Drumstick with thigh portion	90.8	2.8
Drumstick portion (from 3-piece leg)	87.4	2.3

[1] Each percentage is the mean of 80 values, except for the keel and wishbone portions of the breast, based on 40 values.

[2] Wing tips were excluded from wing segment category.

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